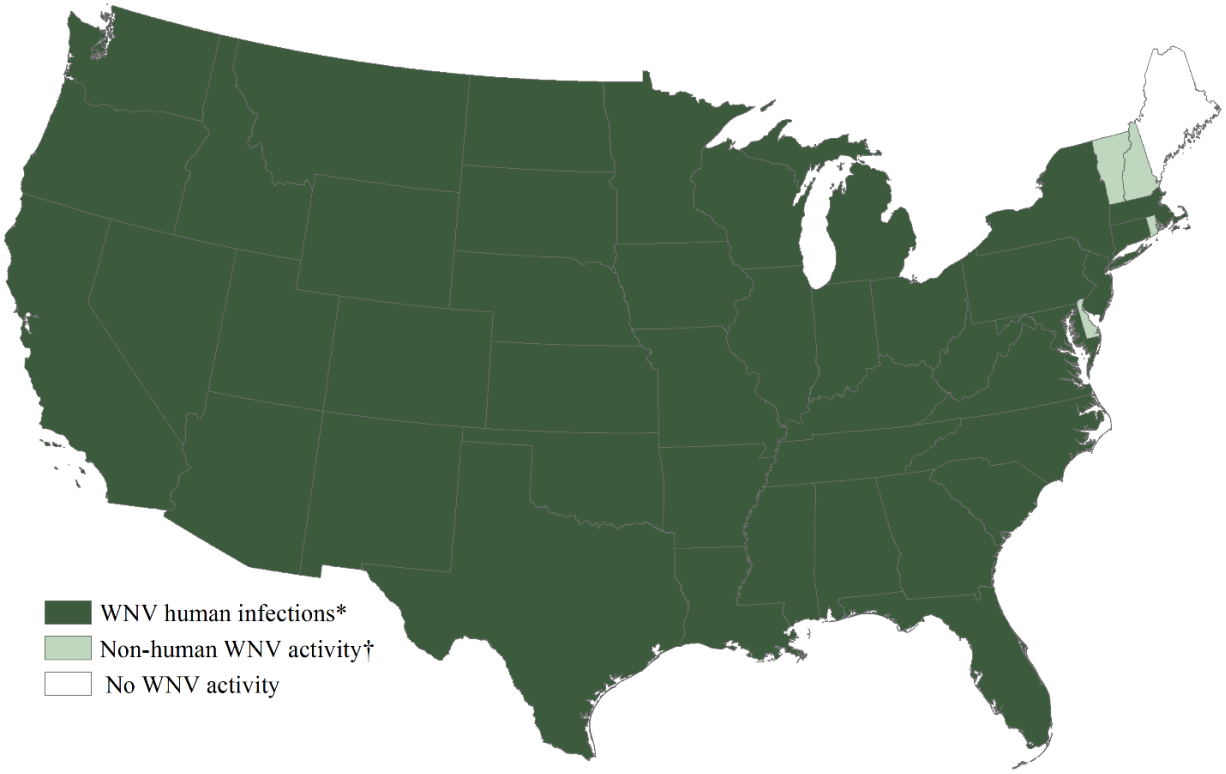
West Nile virus and other arboviral activity -- United States, 2014
Provisional data reported to ArboNET
Tuesday, January 13, 2015

This update from the CDC Arboviral Disease Branch includes provisional data reported to ArboNET for **January 1 – December 31, 2014** for nationally notifiable arboviruses other than dengue. Additional resources for ArboNET and arboviral diseases are provided on page 11.

West Nile virus (WNV) activity in 2014

As of January 13th, 916 counties from 47 states and the District of Columbia have reported WNV activity to ArboNET for 2014, including 43 states and the District of Columbia with reported WNV human infections (i.e., disease cases or viremic blood donors) and 4 additional states with reported WNV activity in non-human species only (i.e., veterinary cases, mosquito pools, dead birds, or sentinel animals) **[Figure 1]**.

Figure 1. West Nile virus (WNV) activity reported to ArboNET, by state — United States, 2014 (as of January 13, 2015)



*WNV human disease cases or presumptive viremic blood donors. Presumptive viremic blood donors have a positive screening test which has not necessarily been confirmed.

†WNV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

WNV human infections reported for 2014

Reported WNV disease cases

To date, a total of 2,122 human cases of WNV disease have been reported from 484 counties in 41 states and the District of Columbia **[Table 1]**. Dates of illness onset for cases ranged from February–December **[Figure 2]**.

Of all WNV disease cases reported, 839 (40%) were classified as non-neuroinvasive disease and 1,283 (60%) were classified as neuroinvasive disease (e.g., meningitis, encephalitis, acute flaccid paralysis) **[Figure 3].** Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Presumptive viremic donors (PVDs)

To date, a total of 337 WNV presumptive viremic blood donors have been reported from 31 states **[Table 1]**. Of these, 31 (9%) developed clinical illness.

Table 1. West Nile virus infections in humans reported to ArboNET, 2014

State	Human disease cases reported to CDC*				Presumptive viremic blood donors
	Neuroinvasive	Non-neuroinvasive	Total	Deaths	
Alabama	0	2	2	1	3
Arizona	80	24	104	12	16
Arkansas	9	2	11	1	0
California	536	251	787	29	95
Colorado	45	69	114	5	9
Connecticut	3	3	6	0	3
District of Columbia	1	2	3	0	0
Florida	11	5	16	1	5
Georgia	10	2	12	1	0
Idaho	5	13	18	0	0
Illinois	27	13	40	3	2
Indiana	8	1	9	0	2
Iowa	5	10	15	0	3
Kansas	17	34	51	0	14
Kentucky	0	1	1	0	0
Louisiana	57	54	111	5	15
Maryland	6	0	6	0	2
Massachusetts	5	1	6	0	1
Michigan	1	0	1	0	1
Minnesota	6	15	21	0	5
Mississippi	26	17	43	6	5
Missouri	12	1	13	2	8
Montana	3	2	5	0	0
Nebraska	41	99	140	5	31
Nevada	3	0	3	0	0
New Jersey	5	2	7	0	0
New Mexico	19	5	24	1	4
New York	16	6	22	1	9
North Carolina	0	0	0	0	1
North Dakota	12	10	22	2	1
Ohio	10	1	11	1	0
Oklahoma	9	9	18	0	12
Oregon	7	1	8	0	0
Pennsylvania	11	1	12	1	5
South Carolina	2	0	2	1	2
South Dakota	12	45	57	0	0
Tennessee	11	4	15	1	2
Texas	235	118	353	4	61
Utah	1	1	2	0	0
Virginia	5	2	7	1	1
Washington	7	5	12	0	6
West Virginia	0	0	0	0	2
Wisconsin	4	3	7	1	11
Wyoming	0	5	5	0	0
Totals	**1,283**	**839**	**2,122**	**85**	**337**

*Includes confirmed and probable cases

Figure 2. WNV disease cases reported to ArboNET, by week of onset — United States, 2014

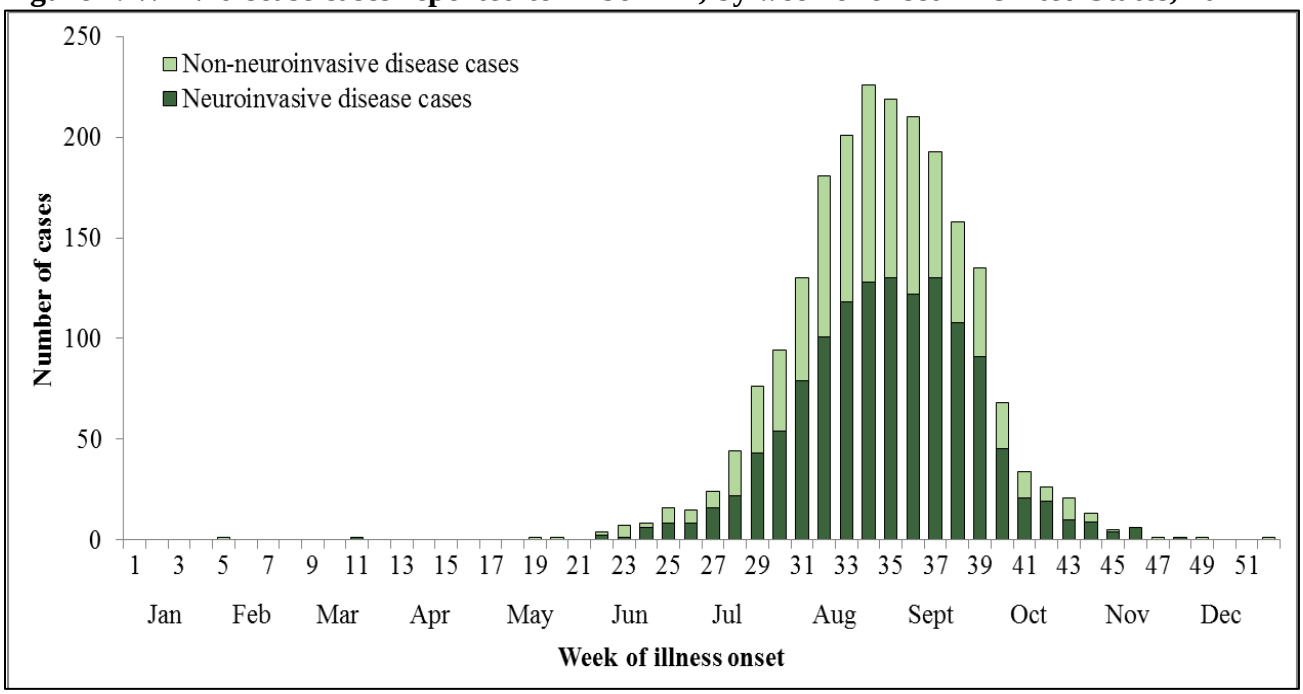
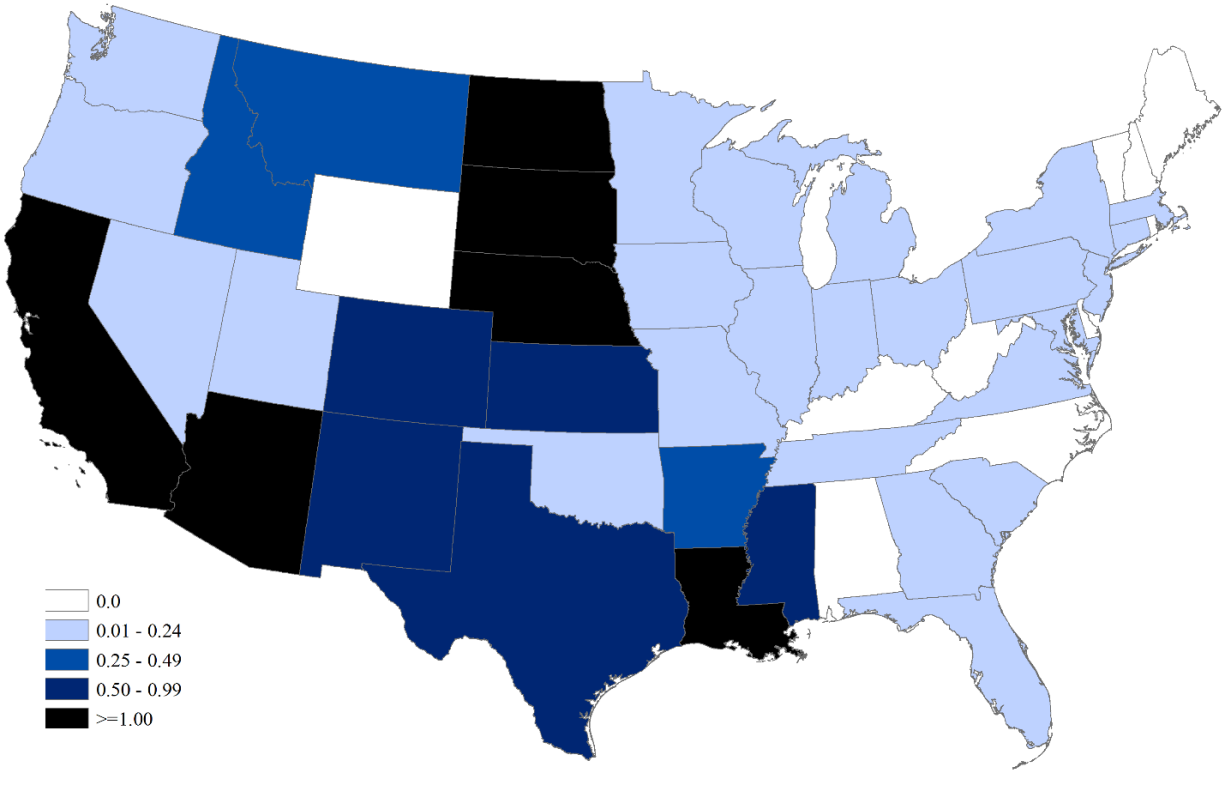


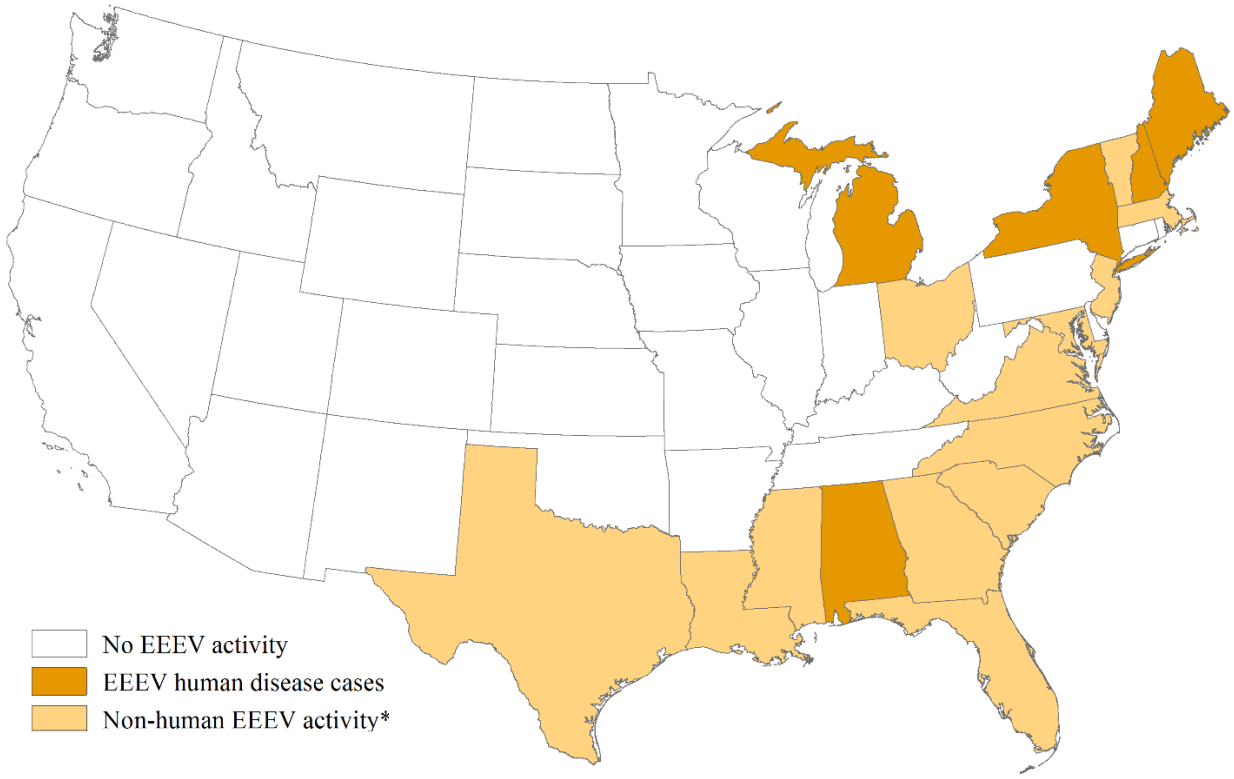
Figure 3. West Nile virus (WNV) neuroinvasive disease incidence per 100,000 population reported to ArboNET, by state — United States, 2014 (as of January 13, 2015)



Eastern equine encephalitis virus (EEEV) activity in 2014

As of January 13th, seven counties in five states have reported human cases of EEEV disease to ArboNET for 2014 **[Figure 4 and Table 2].** Thirteen states have reported EEEV activity in non-human species only. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 4. Eastern equine encephalitis virus (EEEV) activity reported to ArboNET, by state — United States, 2014 (as of January 13, 2015)



*EEEV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 2. Eastern equine encephalitis virus (EEEV) human disease cases reported to ArboNET, United States, 2014

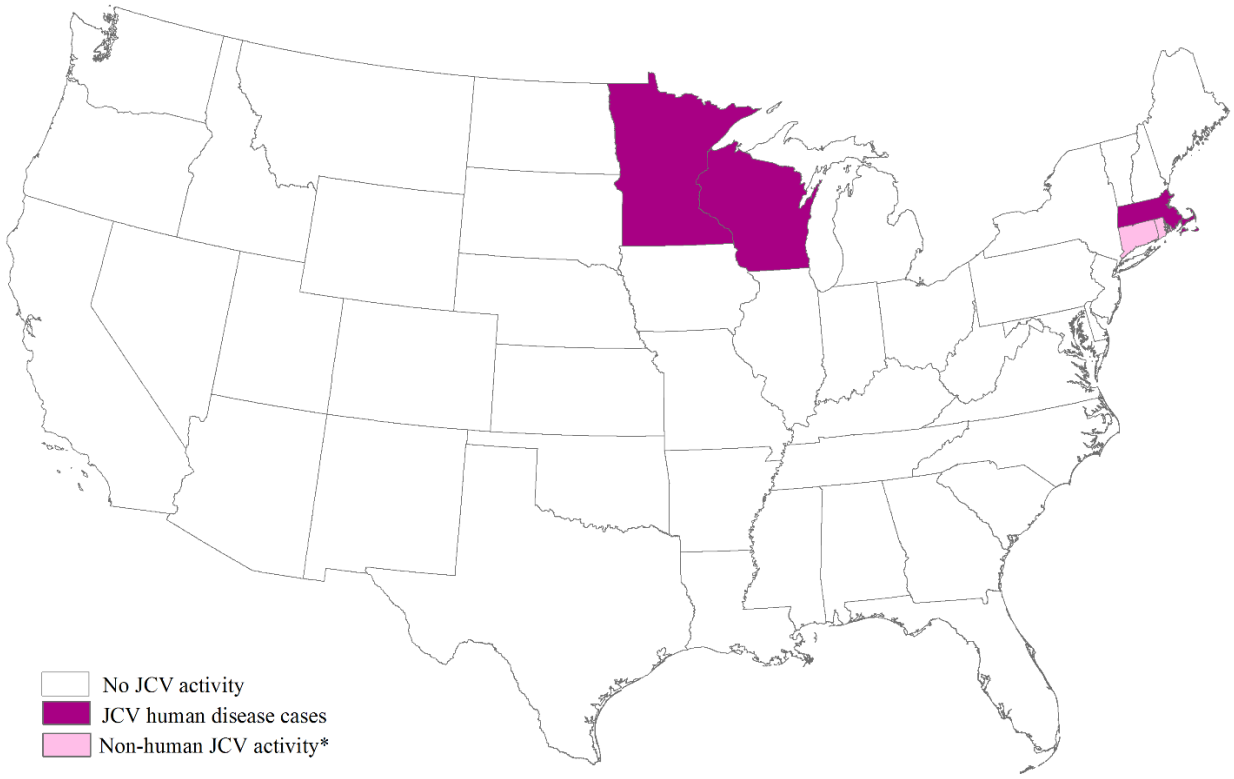
	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Alabama	1	0	1	0
Maine	1	0	1	0
Michigan	1	0	1	0
New Hampshire	3	0	3	2
New York	2	0	2	0
Totals	**8**	**0**	**8**	**2**

*Includes confirmed and probable cases.

Jamestown Canyon virus (JCV) activity in 2014

As of January 13th, seven counties in three states have reported human cases of JCV disease to ArboNET for 2014 **[Figure 5 and Table 3].** Two states have reported JCV activity in non-human species only. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 5. Jamestown Canyon virus (JCV) activity reported to ArboNET, by state — United States, 2014 (as of January 13, 2015)



*JCV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 3. Jamestown Canyon virus (JCV) human disease cases reported to ArboNET, United States, 2014

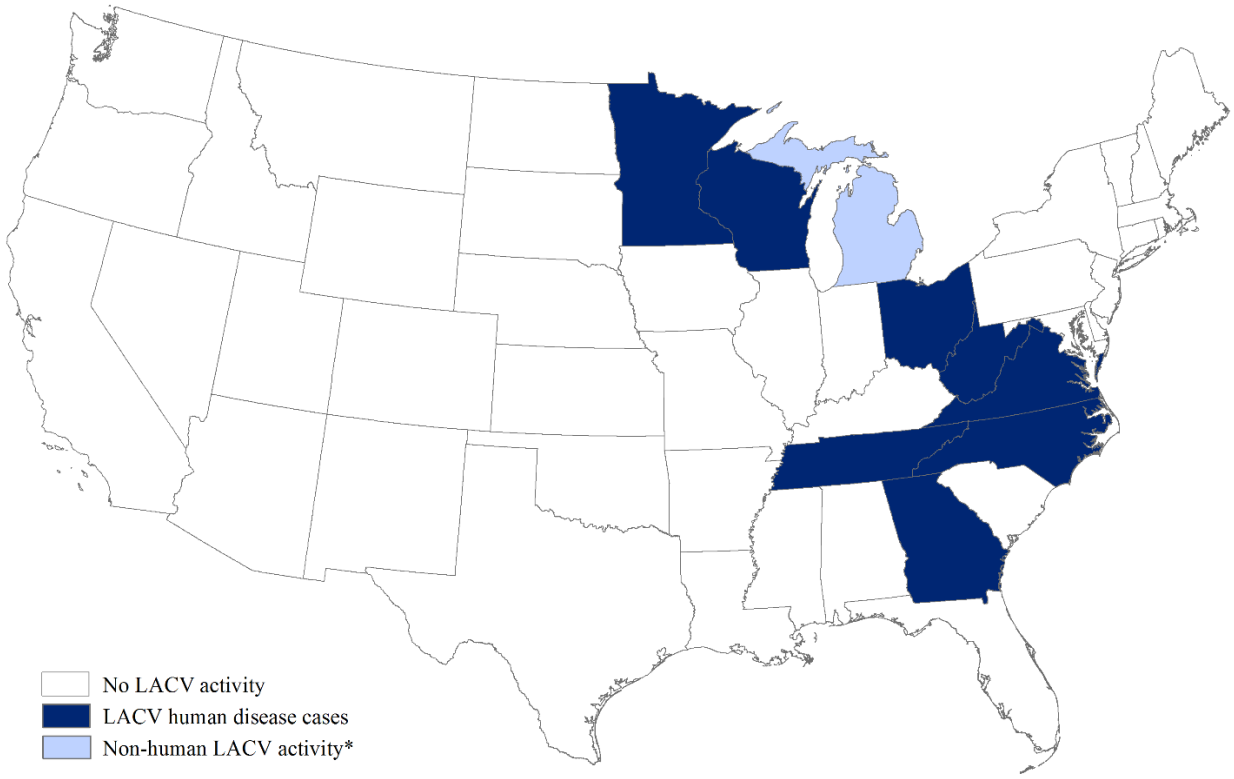
	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Massachusetts	1	0	1	0
Minnesota	1	2	3	0
Wisconsin	2	3	5	0
Totals	**4**	**5**	**9**	**0**

*Includes confirmed and probable cases.

La Crosse virus (LACV) activity in 2014

As of January 13th, 48 counties in eight states have reported human cases of LACV disease to ArboNET for 2014 **[Figure 6 and Table 4].** Michigan has reported LACV activity in non-human species only. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 6. La Crosse virus (LACV) activity reported to ArboNET, by state — United States, 2014 (as of January 13, 2015)



*LACV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 4. La Crosse virus (LACV) human disease cases reported to ArboNET, United States, 2014

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Georgia	1	1	2	1
Minnesota	4	0	4	0
North Carolina	18	0	18	0
Ohio	30	1	31	0
Tennessee	10	0	10	0
Virginia	1	0	1	0
West Virginia	1	1	2	0
Wisconsin	3	1	4	1
Totals	**68**	**4**	**72**	**2**

*Includes confirmed and probable cases.

Powassan virus (POWV) activity in 2014

As of January 13th, six counties in three states have reported human cases of POWV disease to ArboNET for 2014 **[Figure 7 and Table 5]**. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 7. Powassan virus (POWV) activity reported to ArboNET, by state — United States, 2014 (as of as of January 13, 2015)

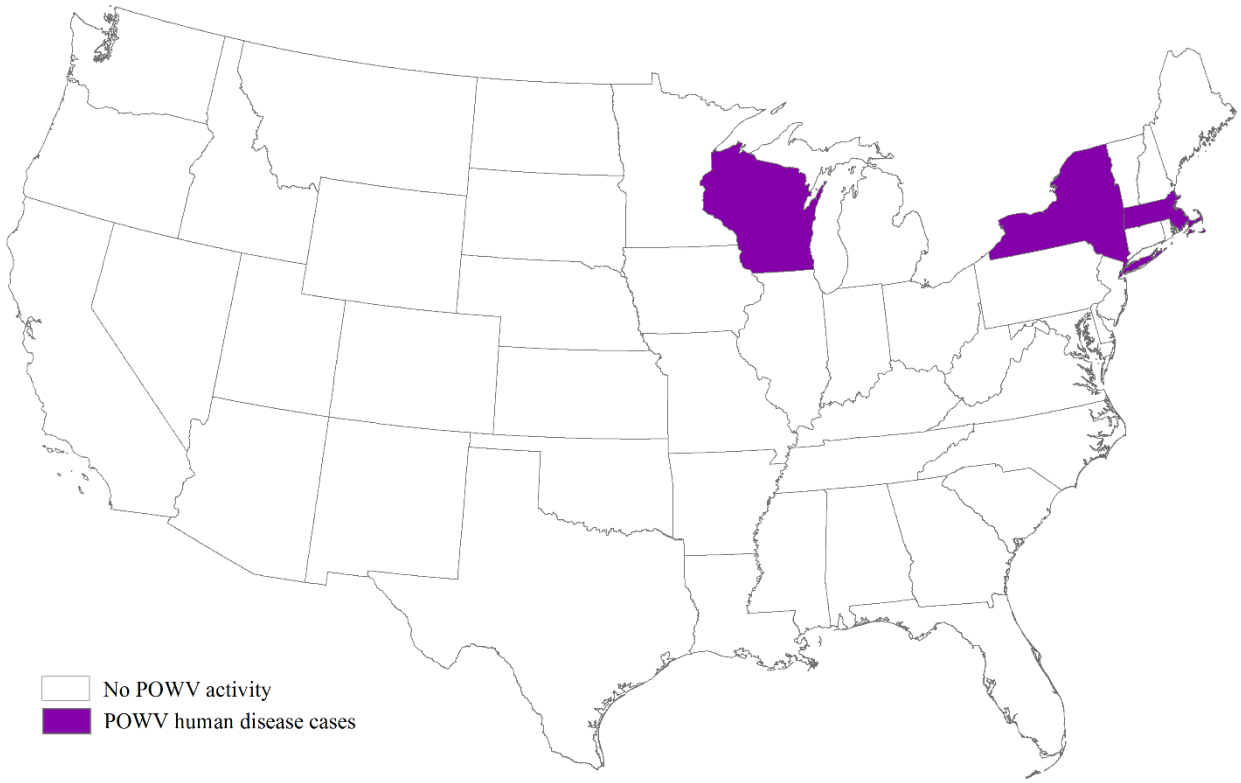


Table 5. Powassan virus (POWV) human disease cases reported to ArboNET, United States, 2014

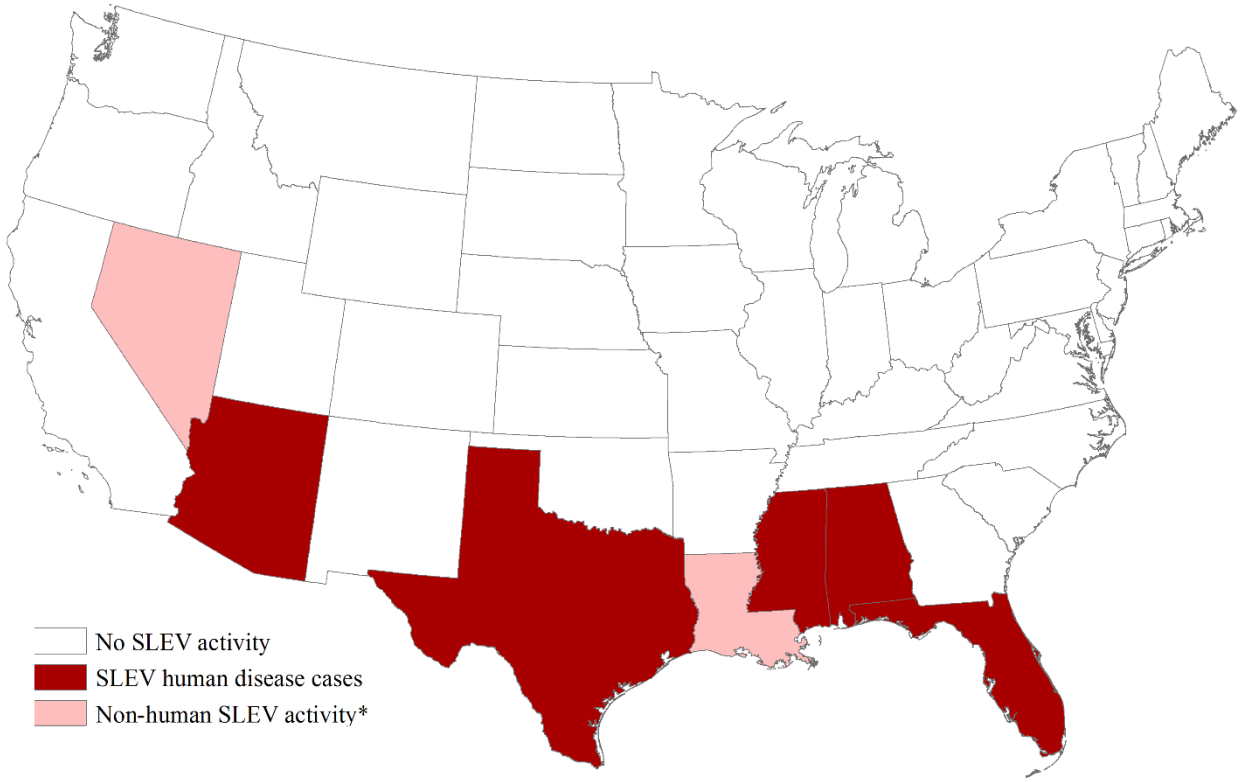
	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Massachusetts	4	0	4	0
New York	0	1	1	0
Wisconsin	2	1	3	0
Totals	**6**	**2**	**8**	**0**

*Includes confirmed and probable cases.

St. Louis encephalitis virus (SLEV) activity in 2014

As of January 13th, seven counties in five states have reported human cases of SLEV disease to ArboNET for 2014 **[Figure 8 and Table 6]**. Two states have reported SLEV activity in non-human species only.

Figure 8. St. Louis encephalitis virus (SLEV) activity reported to ArboNET, by state — United States, 2014 (as of January 13, 2015)



*SLEV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 6. St. Louis encephalitis virus (SLEV) human disease cases reported to ArboNET, United States, 2014

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Alabama	1	0	1	0
Arizona	0	1	1	0
Florida	2	0	2	0
Mississippi	2	0	2	0
Texas	1	3	4	0
Totals	**6**	**4**	**10**	**0**

*Includes confirmed and probable cases.

Table 7. Characteristics of reported cases of arboviral disease, United States, 2014

	EEE N=8		JC N=9		LAC N=72		POW N=8		SLE N=10		WNV N=2,122	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Age group												
<20 years	0	(0)	2	(22)	66	(92)	0	(0)	0	(0)	90	(4)
20-39 years	1	(13)	1	(11)	3	(4)	1	(13)	2	(20)	332	(16)
40-49 years	0	(0)	0	(0)	0	(0)	0	(0)	1	(10)	286	(13)
50-59 years	3	(37)	0	(0)	0	(0)	3	(37)	3	(30)	466	(22)
≥60 years	4	(50)	6	(67)	3	(4)	4	(50)	4	(40)	947	(45)
Unspecified	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6	(<1)
Male sex	4	(50)	4	(44)	34	(47)	7	(88)	4	(40)	1341	(63)
Onset of illness												
January	2	(25)	0	(0)	0	(0)	1	(13)	1	(10)	0	(0)
February	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	1	(<1)
March	0	(0)	0	(0)	1	(1)	0	(0)	0	(0)	1	(<1)
April	0	(0)	0	(0)	0	(0)	2	(25)	1	(10)	0	(0)
May	0	(0)	1	(11)	0	(0)	0	(0)	0	(0)	6	(<1)
June	0	(0)	2	(22)	1	(1)	3	(37)	0	(0)	50	(2)
July	0	(0)	5	(56)	16	(22)	0	(0)	2	(20)	307	(14)
August	3	(37)	1	(11)	27	(38)	0	(0)	4	(40)	913	(43)
September	3	(38)	0	(0)	23	(32)	2	(25)	0	(0)	704	(33)
October	0	(0)	0	(0)	4	(6)	0	(0)	2	(20)	125	(6)
November	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	13	(1)
December	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	2	(<1)
Clinical syndrome												
Nonneuroinvasive	0	(0)	5	(56)	4	(6)	2	(25)	4	(40)	839	(40)
Neuroinvasive												
Encephalitis	6	(75)	3	(33)	55	(76)	4	(50)	4	(40)	590	(28)
Meningitis	1	(13)	1	(11)	12	(17)	2	(25)	1	(10)	537	(25)
Acute flaccid paralysis†	1	(12)	0	(0)	0	(0)	0	(0)	1	(10)	126	(6)
Other neuroinvasive	0	(0)	0	(0)	1	(1)	0	(0)	0	(0)	30	(1)
Outcome												
Hospitalization	8	(100)	5	(56)	71	(99)	8	(100)	10	(100)	1530	(72)
Death	2	(25)	0	(0)	2	(3)	0	(0)	0	(0)	85	(4)

EEE=Eastern equine encephalitis virus; JC=Jamestown Canyon virus; LAC=La Crosse virus; POW=Powassan virus; SLE=St. Louis encephalitis virus; WNV=West Nile virus

† Ninty five WNV disease cases classified as acute flaccid paralysis also had encephalitis or meningitis. One EEEV disease case also had encephalitis.

About ArboNET

ArboNET is a national arboviral surveillance system managed by CDC and state health departments. In addition to human disease, ArboNET maintains data on arboviral infections among presumptive viremic blood donors (PVDs), veterinary disease cases, mosquitoes, dead birds, and sentinel animals. As with other national surveillance data, ArboNET data has several limitations that should be considered in analysis, interpretation, and reporting **[Box]**.

Box: Limitations of ArboNET data

The following should be considered in the analysis, interpretation, and reporting of ArboNET data:

1. ArboNET is a passive surveillance system. It is dependent on clinicians considering the diagnosis of an arboviral disease and obtaining the appropriate diagnostic test, and reporting of laboratory-confirmed cases to public health authorities. Diagnosis and reporting are incomplete, and the incidence of arboviral diseases is underestimated.
2. Reported neuroinvasive disease cases are considered the most accurate indicator of arboviral activity in humans because of the substantial associated morbidity. In contrast, reported cases of nonneuroinvasive arboviral disease are more likely to be affected by disease awareness and healthcare-seeking behavior in different communities and by the availability and specificity of laboratory tests performed. Surveillance data for nonneuroinvasive disease should be interpreted with caution and generally should not be used to make comparisons between geographic areas or over time.

Additional resources

For additional arboviral disease information and data, please visit the following websites:

- CDC's Division of Vector-Borne Diseases:
  http://www.cdc.gov/ncezid/dvbd/

- National Notifiable Diseases Surveillance System:
  http://wwwn.cdc.gov/NNDSS/script/casedef.aspx?CondYrID=963&DatePub=1/1/2015 12:00:00 AM
- U.S. Geological Survey (USGS):
  http://diseasemaps.usgs.gov/

- AABB (American Association of Blood Banks):
  http://www.aabb.org/research/hemovigilance/Pages/wnv.aspx